

**United States Patent** [19][11] **Patent Number:** 5,586,267**Chatwani et al.**[45] **Date of Patent:** Dec. 17, 1996

[54] **APPARATUS FOR PROVIDING FOR  
AUTOMATIC TOPOLOGY DISCOVERY IN  
AN ATM NETWORK OR THE LIKE**

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**Related U.S. Application Data**

[60] Division of Ser. No. 86,431, Jun. 29, 1993, abandoned,  
which is a continuation-in-part of Ser. No. 959,732, Oct. 13,  
1992, Pat. No. 5,519,707.

[51] **Int. Cl.<sup>6</sup>** ..... **G06F 11/30**

[52] **U.S. Cl.** ..... **395/200.11**

[58] **Field of Search** ..... 364/DIG. 1 MS File,  
364/DIG. 2 MS File; 395/200.01, 200.06,  
200.1, 200.11; 370/17, 53, 54

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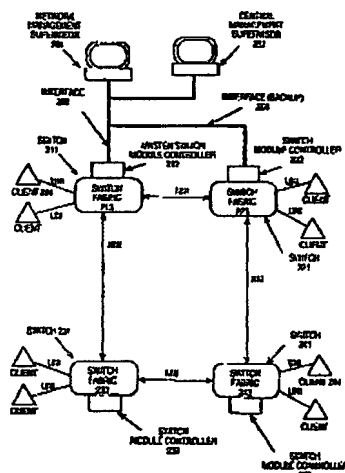
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man

[57] **ABSTRACT**

An asynchronous transfer mode (ATM) network or the like  
employing a method and apparatus for automatically deter-  
mining the topology of the network is described. The  
method and apparatus provides for each switch in the  
network transmitting on each of its ports link advertisement  
messages (without processing intervention by intermediate  
switches). The link advertisement messages are received by  
neighbor switches and forwarded to a topology manager.  
The topology manager constructs network topology profile  
information based on received link advertisement messages.  
Further, the topology manager is able to verify bidirection  
links based on the received link advertisement messages.

**7 Claims, 53 Drawing Sheets**



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      520 MULTICAST?
      412768 COMMUNICAT?
L1      217 MULTICAST? (P) COMMUNICAT?

=> s message (2a) server#
      38600 MESSAGE
      4490 SERVER#
L2      285 MESSAGE (2A) SERVER#

=> s l1 and l2
L3      11 L1 AND L2

=> s group (3a) l2
09:53:49 COPY AND CLEAR PAGE, PLEASE
      539501 GROUP
L4      0 GROUP (3A) L2

=> d his

      (FILE 'USPAT' ENTERED AT 09:51:09 ON 14 MAR 1997)

      SET PAGELength 62
      SET LINELENGTH 78
L1      217 S MULTICAST? (P) COMMUNICAT?
L2      285 S MESSAGE (2A) SERVER#
L3      11 S L1 AND L2
L4      0 S GROUP (3A) L2

=> s l1/ab
      73 MULTICAST?/AB
      67588 COMMUNICAT?/AB
L5      30 (MULTICAST?/AB (P) COMMUNICAT?/AB)

=> s l2/ab
      6163 MESSAGE/AB
      687 SERVER#/AB
L6      14 (MESSAGE/AB (2A) SERVER#/AB)

=> s multicast?/ab and network?/ab
      73 MULTICAST?/AB
      21435 NETWORK?/AB
L7      52 MULTICAST?/AB AND NETWORK?/AB

=> s s client? and server? and broker#
      1416639 S
      3077 CLIENT?
      106 S CLIENT?
      (S(W)CLIENT?)
      5101 SERVER?
      387 BROKER#
L8      0 S CLIENT? AND SERVER? AND BROKER#

=> s client? and server? and broker#
      3077 CLIENT?
      5101 SERVER?
      387 BROKER#
L9      22 CLIENT? AND SERVER? AND BROKER#

=> s l6 or l5 or l7 or l9
L10     93 L6 OR L5 OR L7 OR L9

=>
```

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